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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,261	12/07/2004	Shinya Tabata	2004 1823A	8744
513 7590 12/28/2007 WENDEROTH, LIND & PONACK, L.L.P. 2033 K STREET N. W. SUITE 800 WASHINGTON, DC 20006-1021			EXAMINER SAUNDERS JR, JOSEPH	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/517,261	Applicant(s) TABATA ET AL.	
	Examiner Joseph Saunders	Art Unit 2615	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 32-46, 48-52 and 55-59 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 32-46, 48-52 and 55-59 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. This office action is in response to the communication filed October 9, 2007.

Claims 32 – 46, 48 – 52, and 55 – 59 are currently pending and considered below.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 32, 40, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu (US 2004/0086143 A1), hereinafter Espiritu, in view of Ikeda et al. (WO 200235883 A1), hereinafter Ikeda, (English citations provided from corresponding document US 6,680,430 B2).

**Claims 32, 40, and 41:** Espiritu discloses a loudspeaker comprising: a magnetic circuit; a frame connected to said magnetic circuit; a voice coil within a magnetic gap of said magnetic circuit (not shown however is inherent for this type of speaker configuration in Figure 3); and a diaphragm having an outer peripheral portion bonded to said frame via an edge and also having an inner peripheral portion bonded to said voice coil, said edge being a separate member relative to said diaphragm and bonded thereto (Paragraphs 33 – 34 and Figure 3), and a thickness of a sectional shape of an inner peripheral

portion of said edge is thinner than a thickness of a sectional shape of an outer peripheral portion of said edge (Paragraph 47 and Figure 8).

Espiritu does not disclose wherein said edge comprises a foamed layer, wherein said foamed layer is made of a foamed resin including both an independent foam and a continuous foam, wherein said edge includes skin layers on said foamed layer, wherein an expansion ratio of said foamed resin differs between said inner peripheral portions of said edge and said outer peripheral portion of said edge, and wherein a density of said foamed resin at said inner peripheral portion of said edge is higher than a density of said foamed resin at said outer peripheral portion of said edge. Since Espiritu is concerned with the shape of the edge Espiritu does not disclose other important features, i.e. material properties, that must be taken into consideration when designing the edge of a speaker. Therefore, one of ordinary skill in the art at the time of the invention would be inclined to look elsewhere for teachings of a speaker edge with exemplary characteristics to use in the speaker of Espiritu.

Ikeda also discloses a speaker edge (Column 3 – 4, species 1 – 9) that is a separate member relative to said diaphragm and bonded thereto (second species). Ikeda further discloses that the edge comprises a foamed layer wherein said foamed layer is made of a foamed resin (first species) including both independent and continuous foam (third species), and also discloses wherein said edge includes skin layers on said foamed layer (eight species). “An expansion ratio of the foamed resin differs between said inner peripheral portion of said edge and said outer peripheral portion of said edge,” is a limitation regarding the method of forming a speaker edge

and is not relevant to the issue of patentability of the speaker itself. Therefore, although this limitation is only given weight as to the final product, the limitation is disclosed by Ikeda in the sixth species where "precise control of the foaming ratio" gives rise to the change in density of the ninth species, thereby realizing a loudspeaker resulting in an edge wherein a density of said foamed resin at said inner peripheral portion of said edge at a thin portion is higher than a density of said foamed resin at an outer peripheral portion of said edge, also disclosed by Ikeda (thin portions have higher density than any other thick portions, "affording smooth and even transmission of vibration", ninth species).

It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu using the method of making a speaker edge disclosed by Ikeda since the edge of Ikeda has many advantages over conventional speaker edges including the aforementioned "affording smooth and even transmission of vibration", ninth species, and production of the edge being carried out by easier operations than that of prior art speaker edges (Column 3 Lines 19 – 36).

4. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu and Ikeda in view of Saiki et al. (5,371,805), hereinafter Saiki.

**Claim 33:** Espiritu and Ikeda disclose the loudspeaker according to claim 41, but *do not disclose* wherein said edge includes convexities and concavities alternately arranged in

a peripheral direction of said edge. Saiki discloses a loudspeaker of similar configuration where the edge is divided into alternately arranged convexly rolled and concavely rolled pieces (Column 4 Lines 1 – 6). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu and Ikeda incorporating the feature disclosed by Saiki since “secondary harmonic distortion of sound pressure characteristics, which is caused by the differences between quantities of air displaced by the edge member in the forward and rearward vibrations of the diaphragm, can be greatly reduced” (Column 2 Lines 39 – 44).

5. Claims 34, 39, 46, 48, and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable Espiritu and Ikeda in view of Koura et al. (PUB. NO. JP 05-122791 A), hereinafter Koura and Saeki et al. (JP 58221597 A), hereinafter Saeki.

**Claims 34 and 39:** Espiritu and Ikeda disclose the loudspeaker according to claim 41, wherein the loudspeaker has a length and a width, with the length being greater than the width (Espiritu discloses that the loudspeaker could be for any shape speaker including oval or rectangular, Paragraph 41) but *do not disclose* a variation in thickness of said edge in a lengthwise direction of the loudspeaker is greater than a variation in thickness of said edge in a widthwise direction of the loudspeaker, and a thickness of said edge in a lengthwise direction of the loudspeaker is greater than a thickness of said edge in a widthwise direction of the loudspeaker. Koura discloses a loudspeaker

where the edge is divided into sections in the circumferential direction where the thickness of the material used for the edge changes or varies from section to section around the edge (Paragraphs 7 – 9 of Translation) therefore the thickness in one section would be greater than the thickness in another section. Also since the thickness of the edge is varied at different sections and the thickness may be greater in some sections than other sections along the edge, while at the same time the edge as disclosed by Espiritu and Ikeda is thicker at its outer peripheral than inner peripheral, the ratio from thick to thin in some sections may be greater than the ratio from thick to thin in other sections due to the improvement disclosed by Koura. Saeki further discloses that in a particular speaker where the length is greater than the width, that due to the shape it is beneficial (for obtaining flat frequency characteristics) for edges of the speaker on the sides that are farthest away from the voice coil (i.e., the lengthwise direction) to have an increased stiffness which may be achieved by adding ribs of varying number and shape (changing thickness) (Translated Abstract and Constitution). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu and Ikeda incorporating the feature disclosed by Koura in an oval or rectangular shaped loudspeaker given the teachings of Saeki since Koura's edge sections of varying thickness may be spaced in any manner along the edge and would be well adapted to an oval or rectangular shape to allow for sufficient supporting of the diaphragm needed in the lengthwise direction provided by an edge that is "thick" while allowing for sufficient mobility of the diaphragm

in the widthwise direction where the edge is shorter by providing an edge that is "thin" (Koura, Paragraph 11 of Translation).

**Claim 46:** Espiritu and Ikeda disclose the loudspeaker according to claim 41, wherein the loudspeaker has a length and a width, with the length being greater than the width (Espiritu discloses that the loudspeaker could be for any shape speaker including oval or rectangular, Paragraph 41) but *do not disclose* a thickness of said edge in a lengthwise direction of the loudspeaker is greater than a thickness of said edge in a widthwise direction of the loudspeaker. Koura discloses a loudspeaker where the edge is divided into sections in the circumferential direction where the thickness of the material used for the edge changes or varies from section to section around the edge (Paragraphs 7 – 9 of Translation) therefore the thickness in one section would be greater than the thickness in another section. Saeki further discloses that in a particular speaker where the length is greater than the width, that due to the shape it is beneficial (for obtaining flat frequency characteristics) for edges of the speaker on the sides that are farthest away from the voice coil (i.e., the lengthwise direction) to have an increased stiffness which may be achieved by adding ribs of varying number and shape (changing thickness) (Translated Abstract and Constitution). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu and Ikeda incorporating the feature disclosed by Koura in an oval or rectangular shaped loudspeaker given the teachings of Saeki since Koura's edge sections of varying thickness may be spaced in any manner along the edge and would



be well adapted to an oval or rectangular shape to allow for sufficient supporting of the diaphragm needed in the lengthwise direction provided by an edge that is "thick" while allowing for sufficient mobility of the diaphragm in the widthwise direction where the edge is shorter by providing an edge that is "thin" (Koura, Paragraph 11 of Translation).

**Claims 48 and 55:** Espiritu discloses a loudspeaker comprising: a magnetic circuit; a frame connected to said magnetic circuit; a voice coil within a magnetic gap of said magnetic circuit (not shown however is inherent for this type of speaker configuration in Figure 3); and a diaphragm having an outer peripheral portion bonded to said frame via an edge and also having an inner peripheral portion bonded to said voice coil, said edge being a separate member relative to said diaphragm and bonded thereto (Paragraphs 33 – 34 and Figure 3), and wherein the loudspeaker has a length and a width, with the length being greater than the width (Espiritu discloses that the loudspeaker could be for any shape speaker including oval or rectangular, Paragraph 41).

Espiritu *does not disclose* wherein said edge comprises a foamed layer, wherein said foamed layer is made of a foamed resin including both an independent foam and a continuous foam, wherein said edge includes skin layers on said foamed layer, wherein a density of said foamed resin at said inner peripheral portion of said edge is higher than a density of said foamed resin at said outer peripheral portion of said edge, with a thickness of said edge in a lengthwise direction of the loudspeaker being greater than a thickness of said edge in a widthwise direction of the loudspeaker. Espiritu does disclose that the surround (edge) may be made of rubber, or compressed foam rubber

(Paragraph 40) and applicant discloses in his specification that rubber is also a possible material for the edge. Since Espiritu is concerned with the shape of the edge Espiritu does not disclose other important features, i.e. material properties, that must be taken into consideration when designing the edge of a speaker. Therefore, one of ordinary skill in the art at the time of the invention would be inclined to look elsewhere for teachings of a speaker edge with exemplary characteristics to use in the speaker of Espiritu.

Ikeda also discloses a speaker edge (Column 3 – 4, species 1 – 9) that is a separate member relative to said diaphragm and bonded thereto (second species). Ikeda further discloses that the edge comprises a foamed layer wherein said foamed layer is made of a foamed resin (first species) including both independent and continuous foam (third species), wherein said edge includes skin layers on said foamed layer (eight species), and also discloses wherein a density of said foamed resin at said inner peripheral portion of said edge at a thin portion is higher than a density of said foamed resin at an outer peripheral portion of said edge, also disclosed by Ikeda (thin portions have higher density than any other thick portions, "affording smooth and even transmission of vibration", ninth species).

It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu using the method of making a speaker edge disclosed by Ikeda since the edge of Ikeda has many advantages over conventional speaker edges including the aforementioned "affording smooth and even transmission of vibration", ninth species, and production of the edge

being carried out by easier operations than that of prior art speaker edges (Column 3 Lines 19 – 36).

Koura further discloses a loudspeaker where the edge is divided into sections in the circumferential direction where the thickness of the material used for the edge changes or varies from section to section around the edge (Paragraphs 7 – 9 of Translation) therefore the thickness in one section would be greater than the thickness in another section. Saeki further discloses that in a particular speaker where the length is greater than the width, that due to the shape it is beneficial (for obtaining flat frequency characteristics) for edges of the speaker on the sides that are farthest away from the voice coil (i.e., the lengthwise direction) to have an increased stiffness which may be achieved by adding ribs of varying number and shape (changing thickness) (Translated Abstract and Constitution). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu and Ikeda incorporating the feature disclosed by Koura in an oval or rectangular shaped loudspeaker given the teachings of Saeki since Koura's edge sections of varying thickness may be spaced in any manner along the edge and would be well adapted to an oval or rectangular shape to allow for sufficient supporting of the diaphragm needed in the lengthwise direction provided by an edge that is "thick" while allowing for sufficient mobility of the diaphragm in the widthwise direction where the edge is shorter by providing an edge that is "thin" (Koura, Paragraph 11 of Translation).

6. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu, Ikeda, Koura, and Saeki in view of Sumiyama (PUB. NO. JP 06-125594 A), hereinafter Sumiyama.

**Claim 35:** Espiritu, Ikeda, Koura, and Saeki disclose the loudspeaker according to claim 34, but *do not disclose* wherein a dimension of said inner peripheral portion of said edge is smaller than a corresponding dimension of said outer peripheral portion said diaphragm. Sumiyama discloses a loudspeaker of similar configuration where the outer diameter of the diaphragm is larger than the clamp section of the edge (Drawing 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu, Ikeda, Koura, and Saeki incorporating the feature disclosed by Sumiyama since it allows for the diameter to be enlarged which increases low frequency reproduction while maintaining a small enclosure size (Paragraph 2 of Translation).

7. Claims 36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu, Ikeda, Koura, and Saeki in view of Czerwinski (US 2003/0068064 A1), hereinafter Czerwinski.

**Claim 36:** Espiritu, Ikeda, Koura, and Saeki disclose the loudspeaker according to claim 34, but *do not disclose* wherein said edge is corrugated in a direction from said inner peripheral portion of said edge to said outer peripheral portion of said edge. Czerwinski

discloses a loudspeaker of similar configuration where the cross section of the surround (edge) includes corrugations in the radial direction (Figure 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu, Ikeda, Koura, and Saeki incorporating the feature disclosed by Czerwinski since it allows for the diaphragm to be centered while providing a restoring force to keep the voice coil positioned within the magnetic gap (Paragraph 43).

**Claim 38:** Espiritu, Ikeda, Koura, and Saeki disclose the loudspeaker according to claim 34, but *do not disclose* wherein said edge includes ribs in a peripheral direction of said edge. Czerwinski discloses a loudspeaker of similar configuration where the surround (edge) includes a relatively less-compressed area in the circumferential direction of the edge (Paragraph 41 and Figure 1 Item 30). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu, Ikeda, Koura, and Saeki incorporating the feature disclosed by Czerwinski since it allows for "increased flexibility in a direction which is orthogonal to the diaphragm without losing any rigidity in any direction within the plane of the diaphragm" (Paragraph 44).

8. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu, Ikeda, and Koura in view of Irby et al. (US 6,611,604 B1), hereinafter Irby.

**Claim 37:** Espiritu, Ikeda, Koura, and Saeki disclose the loudspeaker according to claim 34, but *do not disclose* wherein said edge includes ribs in a direction from said inner peripheral portion of said edge to said outer peripheral portion of said edge. Irby discloses a loudspeaker of similar configuration where the surround (edge) has radially position ribs (Item 34). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu, Ikeda, Koura, and Saeki incorporating the feature disclosed by Irby since the ribs allow for better performance in the form of less distortion due to an increased rigidity of the surround (Column 2 Lines 55 – 64).

9. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu and Ikeda in view of Sumiyama.

**Claim 42:** Espiritu and Ikeda discloses the loudspeaker according to claim 41, but *do not disclose* wherein a dimension of said inner peripheral portion of said edge is smaller than a corresponding dimension of said outer peripheral portion of said diaphragm. Sumiyama discloses a loudspeaker of similar configuration where the outer diameter of the diaphragm is larger than the clamp section of the edge (Drawing 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu and Ikeda incorporating the feature disclosed by Sumiyama since it allows for the diameter to be enlarged which increases

low frequency reproduction while maintaining a small enclosure size (Paragraph 2 of Translation).

10. Claims 43 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu and Ikeda in view of Czerwinski.

**Claim 43:** Espiritu and Ikeda discloses the loudspeaker according to claim 41, but *do not disclose* wherein said edge is corrugated in a direction from said inner peripheral portion of said edge to said outer peripheral portion of said edge. Czerwinski discloses a loudspeaker of similar configuration where the cross section of the surround (edge) includes corrugations in the radial direction (Figure 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu and Ikeda incorporating the feature disclosed by Czerwinski since it allows for the diaphragm to be centered while providing a restoring force to keep the voice coil positioned within the magnetic gap (Paragraph 43).

**Claim 45:** Espiritu and Ikeda discloses the loudspeaker according to claim 41, but *do not disclose* wherein said edge includes ribs in a peripheral direction of said edge. Czerwinski discloses a loudspeaker of similar configuration where the surround (edge) includes a relatively less-compressed area in the circumferential direction of the edge (Paragraph 41 and Figure 1 Item 30). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by

Espiritu and Ikeda incorporating the feature disclosed by Czerwinski since it allows for “increased flexibility in a direction which is orthogonal to the diaphragm without losing any rigidity in any direction within the plane of the diaphragm” (Paragraph 44).

11. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Espiritu and Ikeda in view of Irby.

**Claim 44:** Espiritu and Ikeda discloses the loudspeaker according to claim 41, but *do not disclose* wherein said edge includes ribs in a direction from said inner peripheral portion of said edge to said outer peripheral portion of said edge. Irby discloses a loudspeaker of similar configuration where the surround (edge) has radially position ribs (Item 34). It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Espiritu and Ikeda incorporating the feature disclosed by Irby since the ribs allow for better performance in the form of less distortion due to an increased rigidity of the surround (Column 2 Lines 55 – 64).

12. Claims 49 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saiki in view of Ikeda.

**Claims 49 and 56:** Saiki discloses a loudspeaker comprising: a magnetic circuit; a frame connected to said magnetic circuit; a voice coil within a magnetic gap of said



magnetic circuit; and a diaphragm having an outer peripheral portion bonded to said frame via an edge, and also having an inner peripheral portion bonded to said voice coil, said edge being a separate member relative to said diaphragm and bonded thereto, wherein said edge is divided into a plurality of sections in a circumferential direction with convex portions and concave portions alternately arranged (Column 4 Lines 1 – 6).

Saiki does not disclose wherein said edge comprises a foamed layer, wherein said foamed layer is made of a foamed resin including both an independent foam and a continuous foam, wherein said edge includes skin layers on said foamed layer, wherein a density of said foamed resin at said inner peripheral portion of said edge is higher than a density of said foamed resin at said outer peripheral portion of said edge. Since Saiki is concerned with the shape of the edge Saiki does not disclose other important features, i.e. material properties, that must be taken into consideration when designing the edge of a speaker. Therefore, one of ordinary skill in the art at the time of the invention would be inclined to look elsewhere for teachings of a speaker edge with exemplary characteristics to use in the speaker of Saiki.

Ikeda also discloses a speaker edge (Column 3 – 4, species 1 – 9) that is a separate member relative to said diaphragm and bonded thereto (second species). Ikeda further discloses that the edge comprises a foamed layer wherein said foamed layer is made of a foamed resin (first species) including both independent and continuous foam (third species), wherein said edge includes skin layers on said foamed layer (eight species), and also discloses wherein a density of said foamed resin at said

inner peripheral portion of said edge at a thin portion is higher than a density of said foamed resin at an outer peripheral portion of said edge, also disclosed by Ikeda (thin portions have higher density than any other thick portions, "affording smooth and even transmission of vibration", ninth species).

It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Saiki using the method of making a speaker edge disclosed by Ikeda since the edge of Ikeda has many advantages over conventional speaker edges including the aforementioned "affording smooth and even transmission of vibration", ninth species, and production of the edge being carried out by easier operations than that of prior art speaker edges (Column 3 Lines 19 – 36).

13. Claims 50 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sumiyama in view of Ikeda.

**Claims 50 and 57:** Sumiyama discloses a loudspeaker comprising: a magnetic circuit; a frame connected to said magnetic circuit; a voice coil within a magnetic gap of said magnetic circuit; and a diaphragm having an outer peripheral portion bonded to said frame via an edge, and also having an inner peripheral portion bonded to said voice coil, said edge being a separate member relative to said diaphragm and bonded thereto (Paragraph 3 of Translation), wherein a dimension of an inner peripheral of said edge

being smaller than a corresponding dimension of said outer peripheral portion of said diaphragm (Paragraph 2 of Translation and Drawing 3).

Sumiyama does not disclose wherein said edge comprises a foamed layer, wherein said foamed layer is made of a foamed resin including both an independent foam and a continuous foam, wherein said edge includes skin layers on said foamed layer, wherein a density of said foamed resin at said inner peripheral portion of said edge is higher than a density of said foamed resin at said outer peripheral portion of said edge. Since Sumiyama is concerned with the shape of the edge Saiki does not disclose other important features, i.e. material properties, that must be taken into consideration when designing the edge of a speaker. Therefore, one of ordinary skill in the art at the time of the invention would be inclined to look elsewhere for teachings of a speaker edge with exemplary characteristics to use in the speaker of Sumiyama.

Ikeda also discloses a speaker edge (Column 3 – 4, species 1 – 9) that is a separate member relative to said diaphragm and bonded thereto (second species). Ikeda further discloses that the edge comprises a foamed layer wherein said foamed layer is made of a foamed resin (first species) including both independent and continuous foam (third species), wherein said edge includes skin layers on said foamed layer (eight species), and also discloses wherein a density of said foamed resin at said inner peripheral portion of said edge at a thin portion is higher than a density of said foamed resin at an outer peripheral portion of said edge, also disclosed by Ikeda (thin portions have higher density than any other thick portions, “affording smooth and even transmission of vibration”, ninth species).

It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Sumiyama using the method of making a speaker edge disclosed by Ikeda since the edge of Ikeda has many advantages over conventional speaker edges including the aforementioned "affording smooth and even transmission of vibration", ninth species, and production of the edge being carried out by easier operations than that of prior art speaker edges (Column 3 Lines 19 – 36).

14. Claims 51, 52, 58, and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Czerwinski in view of Ikeda.

**Claims 51 and 58:** Czerwinski discloses a loudspeaker comprising: a magnetic circuit; a frame connected to said magnetic circuit; a voice coil within a magnetic gap of said magnetic circuit; and a diaphragm having an outer peripheral portion bonded to said frame via an edge, and also having an inner peripheral portion bonded to said voice coil, said edge being a separate member relative to said diaphragm and bonded thereto (Paragraphs 39 and 40), with said edge being corrugated in a direction from an inner peripheral portion of said edge to an outer peripheral portion of said edge (Paragraph 43 and Figure 4).

Czerwinski *does not disclose* wherein said edge comprises a foamed layer, wherein said foamed layer is made of a foamed resin including both an independent foam and a continuous foam, wherein said edge includes skin layers on said foamed

layer, wherein a density of said foamed resin at said inner peripheral portion of said edge is higher than a density of said foamed resin at said outer peripheral portion of said edge. Since Czerwinski is concerned with the shape of the edge Czerwinski does not disclose other important features, i.e. material properties, that must be taken into consideration when designing the edge of a speaker. Therefore, one of ordinary skill in the art at the time of the invention would be inclined to look elsewhere for teachings of a speaker edge with exemplary characteristics to use in the speaker of Czerwinski.

Ikeda also discloses a speaker edge (Column 3 – 4, species 1 – 9) that is a separate member relative to said diaphragm and bonded thereto (second species). Ikeda further discloses that the edge comprises a foamed layer wherein said foamed layer is made of a foamed resin (first species) including both independent and continuous foam (third species), wherein said edge includes skin layers on said foamed layer (eight species), and also discloses wherein a density of said foamed resin at said inner peripheral portion of said edge at a thin portion is higher than a density of said foamed resin at an outer peripheral portion of said edge, also disclosed by Ikeda (thin portions have higher density than any other thick portions, “affording smooth and even transmission of vibration”, ninth species).

It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Czerwinski using the method of making a speaker edge disclosed by Ikeda since the edge of Ikeda has many advantages over conventional speaker edges including the aforementioned “affording smooth and even transmission of vibration”, ninth species, and production of the edge

being carried out by easier operations than that of prior art speaker edges (Column 3 Lines 19 – 36).

**Claims 52 and 59:** Czerwinski discloses a loudspeaker comprising a magnetic circuit; a frame connected to said magnetic circuit; a voice coil within a magnetic gap of said magnetic circuit; and a diaphragm having an outer peripheral portion bonded to said frame via an edge, and also having an inner peripheral portion bonded to said voice coil, said edge being a separate member relative to said diaphragm and bonded thereto (Paragraphs 39 and 40), and said edge includes ribs in a direction from an inner peripheral portion of said edge to an outer peripheral portion of said edge (Paragraph 41 and Figure 1 Item 30).

Czerwinski does not disclose wherein said edge comprises a foamed layer, wherein said foamed layer is made of a foamed resin including both an independent foam and a continuous foam, wherein said edge includes skin layers on said foamed layer, wherein a density of said foamed resin at said inner peripheral portion of said edge is higher than a density of said foamed resin at said outer peripheral portion of said edge. Since Czerwinski is concerned with the shape of the edge Czerwinski does not disclose other important features, i.e. material properties, that must be taken into consideration when designing the edge of a speaker. Therefore, one of ordinary skill in the art at the time of the invention would be inclined to look elsewhere for teachings of a speaker edge with exemplary characteristics to use in the speaker of Czerwinski.

Ikeda also discloses a speaker edge (Column 3 – 4, species 1 – 9) that is a separate member relative to said diaphragm and bonded thereto (second species). Ikeda further discloses that the edge comprises a foamed layer wherein said foamed layer is made of a foamed resin (first species) including both independent and continuous foam (third species), wherein said edge includes skin layers on said foamed layer (eight species), and also discloses wherein a density of said foamed resin at said inner peripheral portion of said edge at a thin portion is higher than a density of said foamed resin at an outer peripheral portion of said edge, also disclosed by Ikeda (thin portions have higher density than any other thick portions, “affording smooth and even transmission of vibration”, ninth species).

It would have been obvious to one of ordinary skill in the art at the time of the invention to construct the loudspeaker edge disclosed by Czerwinski using the method of making a speaker edge disclosed by Ikeda since the edge of Ikeda has many advantages over conventional speaker edges including the aforementioned “affording smooth and even transmission of vibration”, ninth species, and production of the edge being carried out by easier operations than that of prior art speaker edges (Column 3 Lines 19 – 36).

### ***Response to Arguments***

15. Applicant’s arguments, see pages 8 and 9, filed October 9, 2007, with respect to the rejection(s) of claim(s) 32 and 48 – 52 under various combinations of Espiritu, WO ‘555 (corresponding to U.S. Patent No. 6,543,574), Saiki et al., JP ‘791, JP ‘594,

Czerwinski, Irby et al., and Sumiyama have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Ikeda et al. (WO 200235883 A1 corresponding to US 6,680,430 B2), where Ikeda WO '883 essentially replaces the WO '555 reference relied upon in the previous office action.

16. Applicant's arguments, see page 9, filed October 9, 2007, with respect to the rejection(s) of claim(s) 34 under 35 U.S.C. 103(a) as being unpatentable Espiritu and WO '555 in view of JP '791 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Espiritu and WO '883 (where WO '883 essentially replaces the WO '555 reference relied upon in the previous office action as discussed above) in further view of JP '791 and Saeki et al. (JP 58221597 A). Claims 39, 46, and 48 also recite similar limitations regarding the "rectangularly-shaped" speaker edge and therefore the rejection of claims 39, 46, and 48 also include the JP '597 reference.

### ***Conclusion***

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Saunders whose telephone number is (571) 270-1063. The examiner can normally be reached on Monday - Thursday, 9:00 a.m. - 4:00 p.m., EST.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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December 19, 2007



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SUPERVISORY PATENT EXAMINER